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09/601,788	08/08/2000	Hiroki Koyama	2282-137P	2183

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EXAMINER	
NGUYEN, CAM N	
ART UNIT	PAPER NUMBER
1754	7

DATE MAILED: 06/03/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

MF-7

Office Action Summary

Application No.	Applicant(s)
09/601,788	Koyama et al.
Examiner	**Art Unit**
Cam Nguyen	1754

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *three* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *3/19/02 (amendment/response)*.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above, claim(s) *15-17* is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1 and 3-14* is/are rejected.

7) ☒ Claim(s) *2* is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____
4) ☐ Interview Summary (PTO-413) Paper No(s). _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

1. Newly submitted claims 15-17 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

In accordance with the restriction requirement under rule 35 U.S.C. 121, the claims are divided into 2 groups as follows.

I. Claims 1-14, drawn to a hydrorefining catalyst, classified in class 502, subclass 305+.

II. Claims 15-17, drawn to a method of demetallizing a heavy oil using a catalyst, classified in class 208, subclass 177+.

The inventions are distinct, each from the other because:

Inventions I and II are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case, the product as claimed can be used in a materially different process of using that product, such as for the purification of automotive exhaust gases.

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, and have acquired a separate status in the art as shown

by their different classification, and because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 15-17 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 112 (Second Paragraph)

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A. Claim 9 recites the limitation "metal deposition" in line 2. There is insufficient antecedent basis for this limitation in the claim.

B. Claim 9 recites the limitation "fresh catalyst" in line 2. There is insufficient antecedent basis for this limitation in the claim.

It is suggested that applicants amend the claim to recite "...wherein the active metal is 70 g or more ...".

Claim Rejections - 35 USC § 102(b)

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 3, 10, & 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Sherwood, Jr. et al., "hereinafter Sherwood", (U.S Pat. 5,094,994).

Sherwood discloses a catalyst composition comprising nickel or cobalt oxide and molybdenum oxide, supported on a porous alumina support (see col. 10, ln 10-15), wherein the catalyst is having a total pore volume (TPV) of 0.50-0.75 cc/g, with a pore size distribution such that micropores having diameters of 100-160 A (100-160 A is equivalent to 10-16 nm) constitute 70-85%, and macropores having diameters of greater than 250 A (250 A is equivalent to 25 nm) constitute 1.0-15.0% of the catalyst, and wherein the catalyst has a median pore diameter of 120-130 A (which is equivalent to 12-13 nm) (see col. 6, ln 26-40).

With respect to the claimed limitation on "a median pore diameter determined by the nitrogen adsorption method is 8 to 20 nm", it is considered this limitation is met by the teaching of the reference since Sherwood teaches a median pore diameter of 12-13 nm (see Sherwood at col. 6, ln 26-40), which overlaps the claimed range.

With respect to the claimed limitation on "a pore volume determined by the nitrogen adsorption method is 0.56-1.0 cm^3/g", it is met by the teaching of the reference because

Sherwood teaches a pore volume of 0.50-0.75 cc/g (see Sherwood at col. 6, ln 26-40), which falls within the claimed range.

With respect to the claimed limitation on "a pore volume of pores having a pore diameter of 50 nm or larger determined by the mercury intrusion porosimetry method is 0.32-1.1 cm^3/g", it is considered this limitation is met by the teaching of the reference because Sherwood teaches a total pore volume (TPV) of 0.50-0.75 cc/g and wherein macropores having diameters of greater than 250 A, which is greater than 25 nm (see Sherwood at col. 6, ln 26-40). Note that, "greater than 25 nm" encompasses the claimed limitation "50 nm or larger", and the disclosed pore volume of 0.50-0.75 cc/g falls within the claimed range of 0.32-1.1 cm^3/g.

Regarding claims 3, 10, & 11, recitation of the intended use limitations in the claims are noted. It is noted that these are merely recitations of the intended use of the claimed catalyst, and that the patentability of the claimed catalyst does not depend on these recitations, but instead the limitations of the catalyst are able to stand alone itself. See *In re Pearson*, 181 USPQ 641 & *In re Thrau*, 57 USPQ 324.

Claim Rejections - 35 USC § 102(b)/103

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 4, 5, & 8 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Sherwood, Jr. et al., "hereinafter Sherwood", (U.S Pat. 5,094,994).

Sherwood discloses a catalyst as described above, except for the following differences.

Regarding claim 4, Sherwood does not indicate that his catalyst composition has the claimed limitation "a pore volume of pores with pore diameter of not less than 1,000 nm measured by the mercury intrusion porosimetry method is not more than 0.2 cm3/g". However, it appears met by the teaching of a small number of large pores.

Regarding claim 5, Sherwood is silent with respect to the bulk density. However, it is considered that the catalyst as disclosed would possess the same bulk density in view of the same pore volume and pore diameter disclosed by Sherwood and applicants.

Regarding claim 8, recitation of product-by-process limitation in the claim is noted. While the product of the reference is not made by the same process, the product made is the same. It has been held that "even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method or production. If the product in the product-by-process

claim is the same as or obvious from a product of the prior art, the claim is unpatentable even the prior art product was made by a different process." See *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 6, 7, & 9 are rejected under 35 U.S.C. 103(a) as unpatentable over Sherwood, Jr. et al., "hereinafter Sherwood", (U.S Pat. 5,094,994), as applied to claims 1, 3, 10, & 11 above, and in further view of Simpson (U.S Pat. 4,879,265).

Sherwood discloses a catalyst as described above, and further discloses the catalyst composition comprises 1.0-5.0 wt.% of oxide of nickel or cobalt (see Sherwood at col. 5, ln 20-22).

Regarding claim 6, Sherwood does not disclose the claimed molybdenum amounts. It would have been *prima facie obvious* to one of ordinary skill in the art at the time the invention was made to utilize molybdenum at the amounts as taught by Simpson in order to obtain an effective catalyst, because Simpson fairly suggests using about 3 to about 17 wt.% of

molybdenum is sufficient for obtaining an effective catalyst composition (see Simpson at col. 8, ln 54-55).

Regarding claim 7, Sherwood does not contain phosphorus in his catalyst composition. However, it would have been *prima facie obvious* to one of ordinary skill in the art at the time the invention was made to incorporate phosphorus into the catalyst of Sherwood in order to obtain a catalyst having improved in catalytic activity because Simpson fairly teaches utiiizing phosphorus at an amount of up to 4 wt.% is sufficient for the catalyst (see Simpson at col. 8, ln 56).

Regarding claim 9, it is considered the claimed limitation on "an effective amount of metal deposition is 70 g or more per 100 g of the fresh catalyst" is met by the teaching of the reference in view of 35 U.S.C. 112 (second paragraph) issues as discussed above.

The instantly claimed molybdenum, nickel or cobalt, and phosphorus amounts are met by the reference since they fall within the disclosed ranges.

10. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Simpson (U.S Pat. 4,879,265).

Simpson discloses a process of preparing a catalyst by impregnating the catalytically active metal components with any porous amorphous refractory support particles including gamma alumina (see col. 5, ln 42-51). The support is having a particle size of less than about 100 microns (see col. 5, ln 67- col. 6, ln 1). The total pore volume of the amorphous support is usually from about 0.2 to 2.0 cc/g (see col. 6, ln 41-43). The extruded particles are taught to be having a cross-sectional shape (see col. 6, ln 13-33), thus suggests molding of the support particles. In

view of the teaching at col. 6, ln 3-12, the support particles in the form of alumina gel is heat treated to convert into gamma alumina, thus suggests calcining. Simpson further discloses impregnating the active metal components on the support particles to obtain a catalyst (see col. 6, ln 33-35). After impregnation, the support is dried and calcined to produce a catalyst containing active components (see col. 7, ln 25-27).

Simpson discloses a particle diameter of 100 microns, but does not indicate whether the disclosed diameter being a mean particle diameter as applicants claiming. However, it is considered *prima facie obvious* to one of ordinary skill in the art that the mean particle diameter of the support particles disclosed by Simpson would be within the claimed range (of from 10 to 200 μm) since the disclosed particle diameter falls with the claimed range (see Simpson at col. 5, ln 67- col. 6, ln 1).

11. Claims 13 & 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simpson (U.S Pat. 4,879,265), as applied to claim 12 above, and further in view of Asaoka et al., "hereinafter Asaoka", (U.S Pat. 4,562,059).

Simpson discloses a process of preparing a catalyst as described above, except for the following difference.

Simpson does not specifically indicate in the reference that his gamma alumina is obtained by calcining the boehmite powder as applicants claiming. However, such gamma alumina as prepared is conventional and known by Asaoka, as a useful carrier having a large surface,

excellent mechanical strength and ability of support catalytic metals uniformly on its surface (see Asaoka at col 1, ln 7-17).

Allowable Subject Matter

12. Claim 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art does not disclose or fairly suggest a catalyst having the properties as specified in claim 1 and wherein the pore volume determined by mercury intrusion porosimetry method is 0.87 cm^3/g or greater.

Response to Amendment/Arguments

13. Applicants' amendment/response filed on 3/19/02 has been reconsidered, but deemed not persuasive in view of the the new grounds of rejections above.

Applicants' urging regarding claim 12 on the Simpson reference for not teaching the claimed pore volume of the support material is noted. Applicants' urging is not found persuasive because applicants claiming a support material having "a pore volume of 0.75 cm^3/g or greater" and that Simpson teaches amorphous support having a pore volume ranging from about 0.2 to about 2.0 cc/g, preferably about 0.25 to about 1.0 cc/g, and most preferably about 0.3 to about 0.9 cc/g (see Simpson at col. 6, ln 41-46). The claimed pore volume falls within the disclosed pore volume range, therefore the claim is met.

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Citations

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PTO-892 Form attached to this Office Action.

Conclusion

16. Claims 1-17 are pending. Claims 1 & 3-14 are rejected. Claim 2 is objected. Claims 15-17 are withdrawn due to nonelected (distinct) invention. No claims are allowed.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Cam Nguyen, whose telephone number is (703) 305-3923. The examiner can normally be reached on M-F from 8:30 am. to 6:00 pm, with alternative Monday off.

The appropriate fax phone number for the organization where this application or proceeding is assigned is (703) 872-9310 (before finals) and (703) 872-9311 (after-final).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Nguyen/cnn CNN

May 30, 2002

STUART L. HENDRICKSON
PRIMARY EXAMINER